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## THE MAMMALIAN FAUNA OF CHESHIRE.

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THE following paper makes no claim to be an exhaustive treatise on the existing Mammalia of Cheshire, but is merely a summary of our present knowledge of the subject. It has been written mainly in the hope that the facts therein recorded may induce other observers to co-operate with the writers in the compilation of such a list of the vertebrates of the county as shall be of practical utility to resident naturalists, and not without interest to all students of this section of the British fauna.

Cheshire is a maritime county in the West of England, separated from Lancashire on the north by the river Mersey and its tributary the Tame; from Yorkshire in the extreme north-east by the ridge of hills which forms the watershed of the Mersey and Yorkshire Ouse; from Derbyshire and Staffordshire in the east by the rivers Etherow, Goyt, and Dane, tributaries of the Mersey; and from Flintshire and Denbighshire on the south-east by the Dee. The county is bounded on the south by Shropshire and parts of Staffordshire and Flintshire, but the borderline is not a natural one.

The greater part of the county, which has a total area of 1102 square miles, is an extensive and nearly level plain which rests upon the New Red Sandstone, and is seldom more than from two to three hundred feet above the sea-level. Here and there, however, the older Triassic rocks rise abruptly from the surrounding red marl, and attain an altitude of over 500 ft. at Beeston Castle, Eddisbury, and Harrol Edge, near Frodsham,

and 604 ft. at Alderley Edge. Except in the neighbourhood of the few manufacturing towns, the Cheshire plain now presents a peaceful pastoral aspect, extensive grazing and dairy tracts, which are among the most important in England, being interspersed with numerous game-coverts and large well-timbered parks; the heaths and peat-mosses have been almost entirely reclaimed, and the Royal Forest of Delamere, between Northwich and Chester, alone remains of the extensive natural woodlands which once covered the greater part of its surface. The whole country is well watered by the Bollin, Dane, Weaver, and Gowy, which flow into the Mersey, and is studded with numerous small lakes or meres, of which Rostherne, Tatton, Doddington, Budworth, and Combermere may be cited as examples; whilst nearly every field contains one or more marl-pits, which formerly constituted the sole source of the manure-supply for the permanent pastures. In the north-western part of the county, between the estuaries of the Dee and Mersey, is a hammer-headed peninsula, called Wirral, whose natural features do not differ materially from those of the central plain.

In the east and north-east the character of the country is entirely different. The scenery in many places is very wild and romantic, and the hills of millstone grit, rising to 1833 ft. at Shining Tor, near Macclesfield, and to 1908 ft. at the head of Heyden Brook in Longdendale, with their long lines of terraced or steeply-scarped edges and broad stretches of breezy grouse-moor, form a striking contrast to the fertile and well-wooded plain of the Trias.

Of the literature of our subject there is but little to be said. The earliest work which contains more than a casual reference to any of the Mammalia is 'A Discription Historicall and Geographical of the Countie Palatine of Chester,' published at Chester in 1656. In speaking of Delamere and Maxfield Forests, the author, Daniel King, says:—"Besides the great store of Deer both Red and Fallow, in the two Forests before named; there is also great plenty of Hares: In hunting whereof the gentlemen do pass much of their time, especially in Winter; also great store of Conies, both black and gray; namely in the places where it is Sandy ground; neither doth it lack Foxes, Foulmards, Otters, Basons,\* and such like." Dr. Charles Leigh's 'Natural

\* Bason, Bawson, and Boreson, *i. e.*, the Badger.



History of Lancashire, Cheshire, and the Peak of Derbyshire,' published in 1700, contains nothing of interest beyond a description of the Red Deer at Lyme, and a brief notice of the Fallow Deer in Dunham Park. In 1854 "The Fauna of Liverpool," by Isaac Byerley, was published as an appendix to the 'Proceedings' of the Liverpool Literary and Philosophical Society. The writer enumerates thirty-one species of mammals for Cheshire, exclusive of domesticated forms; and, although the records of two species—the Lesser Horseshoe Bat and the Harvest Mouse—can only be accepted with hesitation, the list contains much valuable information, and is interesting as the first attempt to give a detailed account of the mammals of even a portion of the county. Dr. J. D. Sainter's 'Scientific Rambles round Macclesfield' appeared twenty-four years later, and included a list of the birds, mammals, and reptiles of the neighbourhood. This list, however, contains many obvious inaccuracies, and is consequently of little practical value. An excellent list of the Seals and Whales of the Dee and Mersey estuaries, by the late T. J. Moore, is given in 'The Second Report on the Fauna of Liverpool Bay,' published in 1889 by the Liverpool Marine Biology Committee. The most recent list, and the only one which embraces the whole county, was contributed by Mr. R. Newstead to the 'Proceedings' of the Chester Society of Literature and Natural Science (No. iv. 1894) under the title of "A Preliminary List of the Mammals of Cheshire and North Wales." Mr. Newstead enumerates twenty-eight terrestrial species for Cheshire, but does not include the Seals and Cetaceans.

In addition to these lists there are many scattered records in 'The Zoologist,' 'The Naturalist,' 'The Field,' and the columns of 'The Manchester City News.' We have also consulted Bell's 'British Quadrupeds,' various works on local topography, and the 'Proceedings' of local scientific societies.

It remains to say that we have received valued help in the shape of notes and specimens from several correspondents, and we take this opportunity of tendering to them collectively our warmest thanks.

Before proceeding to consider the existing fauna we may briefly review what evidence we have of species which have disappeared during, or immediately prior to, the historic period. Owing to the absence of the limestone caverns, which have

yielded such a rich harvest of mammalian remains in the neighbouring counties of Derby and York, our knowledge of the ancient fauna is comparatively scanty, though it would probably be considerably extended by the investigation of old MSS. relating to the county—a field of research pertaining to the province of the antiquary rather than the naturalist,

There can be little doubt that the Wolf (*Canis lupus*) formerly abounded in the Cheshire forests, and its remains are of frequent occurrence in the superficial deposits of Wirral (A. Hume, 'Antiquities of the Cheshire Coast,' p. 350).

Skulls of *Bos primigenius* have been found in the peat-beds at Leasowe and Wallasey, and at various places in the bed of the Manchester Ship Canal. The smaller domesticated Ox (*B. longifrons*) was probably abundant. We have seen skulls from the peat-beds at Leasowe, the bed of the Mersey near Warrington, Chester, and several places on the line of the Ship Canal.

The forest recesses and the reed-beds fringing the meres afforded suitable covert for the Wild Boar (*Sus scrofa*), whose memory is preserved in the place-name Wild Boar Clough, near Macclesfield. Its tusks are of frequent occurrence near Roman stations (Hume, *op. cit.* p. 350), and some years ago a skeleton was dug up from a peat-bog at Mobberley (Wm. Norbury, 'Proc. Lanc. and Chesh. Antiquarian Society,' vol. ii. p. 65).

We have etymological evidence of the existence of the Roebuck (*Capreolus capræa*) in Roelau, one of the hundreds into which the county was formerly divided; and in Domesday Book we read that at Wivreham (Weaverham) and Chingeslie (Kingsley), both in the hundred of Roelau, there were respectively one and four\* hays for roes.

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\* The word *haia* is frequently mentioned in Domesday Book under the heading of Audlem, Wrenbury, Bredbury, Adlington, Worleston, &c.; but *haia capreolorum* occurs only in connection with Weaverham and Kingsley. The following explanation of the word is given by Beamont ('A Literal Extension and Translation of the portion of Domesday Book relating to Cheshire and Lancashire,' Introduction, p. xxxi):—"The word *hay*, in its original, is Saxon, and signifies a hedge, whence the quickset, its most frequent material, is a hawthorn, or, in our Lancashire vernacular, a *haythorn*. The transition was easy from that which enclosed to that which it enclosed, and so the latter naturally became a *hay*. The hays were chiefly made in the woods and forests, and, except such as were intended for the roe, were forbidden to be made of any great height; and they were so contrived



The forty-four species which now inhabit Cheshire, or visit its estuaries as stragglers, are divided into the following Orders:—

Chiroptera	...	...	...	7 species.
Insectivora	...	...	...	5 „
Rodentia	...	...	...	13 „
Ungulata	...	...	...	3 „
Carnivora	...	...	...	10 „
Cetacea	...	...	...	6 „

The Bats as a group have been greatly neglected, and further research will doubtless result in the addition of other species. Natterer's Bat (*Vespertilio nattereri*) has escaped attention hitherto. It has been recorded from South Lancashire (C. Oldham, Zool. 1893, p. 457), and its addition to the Cheshire fauna is probably only a question of time.

All the Insectivora and Rodentia included by Bell in his 'British Quadrupeds' occur in the county, but, owing to their small size and retiring habits, several of the species are often overlooked, and are probably more plentiful than is generally supposed.

Incessant war is waged by gamekeepers against the terrestrial Carnivora, while the Polecat and Marten are practically extinct. In the 'Manchester City News' for Nov. 3rd, 1883, the late J. F. Robinson described a cat which had been trapped some years previously in Delamere Forest, and which he considered to be a genuine Wild Cat; the evidence he adduces, however, hardly appears to warrant the inclusion of *Felis catus* among the Cheshire mammals. There is reliable evidence of the occurrence of three Seals, but we do not think that Dr. C. Collingwood was justified (Proc. Liv. Lit. Phil. Soc. vol. xviii. p. 162) in assuming that the pied Seal mentioned by Pennant ('British Zoology,' vol. i. p. 177), as having been taken near Chester in May, 1766, was an example of the Mediterranean *Monachus albiventer*. Pennant's description of the creature is too vague to admit of a satisfactory determination of the species.

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that, at certain seasons, the deer could be driven into them to be taken or inspected, which was called a *stabilitio*, as the stand where the owner or sportsman stood was called a *stabilitura*. We never meet with these hays in places which are said to be waste. The *haia capreolorum* was a hay for roes, and a *dimidia haia* was half a hay, or a hay unfinished." For further notes on "Roe-deer hays," see Harting, 'Essays on Sport and Nat. Hist.' 1888, p. 41.

The Fallow Deer is included among the Ungulata, though it is known only as a park animal, and there is no evidence to show that it was ever really wild in this county.

Cetaceans entering the estuaries are frequently left stranded on the vast sand-banks which are exposed at low-water, but it is comparatively seldom that they come under the notice of competent naturalists; and other species than those recorded have probably occurred.

Order CHIROPTERA.—Family RHINOLOPHIDÆ.

*Rhinolophus hipposideros* (Bechst.); Lesser Horseshoe Bat.—Byerley has recorded the occurrence of a Lesser Horseshoe Bat at Storeton quarry, near Birkenhead, about the year 1834, but the record rests on the sole authority of a taxidermist named Mather, and requires verification.

Family VESPERTILIONIDÆ.

*Plecotus auritus* (L); Long-eared Bat.—This species is probably fairly plentiful throughout the county. Byerley describes it as "very common in the district"; Mr. R. Newstead says, "widely distributed throughout the district, but not so common as *V. noctula*," and adds that he has frequently seen it hawking for flies in broad daylight during the warm days of early spring. It is common in the Mid-Cheshire district, and we have obtained specimens at Bowdon, Sale, Northen Etchells, Wythenshawe, and several times in the copper mines at Alderley Edge. Mr. T. D. Sykes informs us that he has frequently shot it on the Cheshire bank of the Mersey, near Cadishead, and the Rev. H. G. Barnacle states that it is not uncommon at Holmes Chapel. The choice of a diurnal resting-place by this bat is very varied. We have found it between the ceiling and roof of a cottage, in a timber-stack, in a crevice in the bark of a birch-tree, and Mr. A. Salmon, of Bowdon, has taken numbers from holes in beeches in Dunham Park.

*Synotus barbastellus* (Schreb.); Barbastelle.—There is a female specimen in alcohol in the British Museum labelled "Cheshire," but no further data are given (G. E. Dobson, 'Cat. Chiroptera in Coll. Brit. Mus.' 1878, p. 177).

*Vesperugo pipistrellus* (Schreb.); Pipistrelle.—Probably generally distributed and common. Byerley describes it as the "most

common bat in the district," and Mr. Newstead also states that it is the commonest species. Personally we have only obtained the Pipistrelle in Dunham Park, where it is abundant. It appears about the same time in the evening as the Noctule, and generally flies low under the trees, although Coward has shot it flying round the tops of high beeches.

*V. noctula* (Schreb.); Noctule; Great Bat; Fox Bat.—Probably common wherever there is old timber. Byerley states that "Mr. Mather remembers having stuffed specimens taken from Birkenhead Abbey many years ago, before the additional building. Once or twice from other localities. If now in the neighbourhood it is very scarce"; but Mr. Newstead says it is "common and generally distributed." There is a specimen in the Grosvenor Museum, Chester, from Manley, dated 1889. We have seen Noctules on the wing at Lymm, Hatchmere, Mouldsworth, Higher Peover, and Capesthorpe, and have obtained specimens from Timperley, Knutsford, and Dunham Park. In this last locality, where it is exceedingly plentiful, it spends the day in the cavities of the old oaks, which abound in the park, and usually leaves these resting-places about forty minutes after sunset. At first these bats fly very high, squeaking and chasing one another around and above the tree-tops. During summer they frequent the open glades, generally flying high; but towards the middle of September they resort in great numbers to the water-meadows by the river Bollin, flying up and down alongside the park-wall, often not more than ten or twelve feet from the ground. When shooting at them they will often suddenly dart down and almost touch the muzzle of the gun. On dissecting two Noctules which Mr. G. O. Day sent us, taken from a house-roof in Knutsford on March 19th, 1894, we found a mass of half-digested beetles and flies in their stomachs, from which it was inferred that they had been recently on the wing. In Cheshire we have not seen this species later than Sept. 18th, though Coward has observed it in Derbyshire on the 22nd of that month, and in Surrey on Oct. 1st.

*Vespertilio daubentonii*, Leisler; Daubenton's Bat.—Occurs in several localities, and is probably generally distributed. Byerley states that nine out of two or three dozen were taken by Mr. Nicholas Cooke, of Warrington, from their lurking-place in a hollow tree in Delamere Forest, and one of them was identified by

the British Museum authorities. Two unlabelled specimens in the Warrington Museum were possibly obtained on this occasion. This species has been taken in winter in the copper-mines at Alderley Edge. One was taken on Dec. 26th, 1892 (C. Oldham, Zool. 1893, p. 103), and another captured on Dec. 15th, 1894. Coward has obtained several specimens from one of the pools in Dunham Park. We have observed it flying over a large horse-pond near Mouldsworth, at the pool in Higher Peover Park, and on the Ellesmere Canal at the point where it is crossed by the Whitchurch and Tarporley road. The bats in the last locality were restricted to a small area where the towing-path is overhung by trees, and although search was made, no others were seen on the canal for a mile in either direction. Daubenton's Bat comes abroad about seventy minutes after sunset, and it is difficult to distinguish the bats from their shadows as they skim over the surface of the water. We have not seen this species on the wing later than August 17th, although we paid several visits to the pool in Dunham Park during the latter half of that month and September, 1894, in the hope of finding it.

*V. mystacinus*, Leisler; Whiskered Bat.—Widely distributed. One was found asleep on the top of a stone wall at Fernilee, near Whaley Bridge, on May 30th, 1885 (W. D. Roebuck, 'Naturalist,' 1886, p. 113), and another was knocked down near the same place at mid-day on April 26th, 1886 (T. A. Coward, Zool. 1888, p. 222). We obtained a specimen which was hawking up and down a hedge-side at dusk, at Northen Etchells, on Sept. 15th, 1888, and another in a similar spot at Mouldsworth, in June, 1894. One which we took from beneath the bark of a dead fir in Delamere Forest on August 7th, 1893, is now in the Grosvenor Museum, Chester. We have examined a specimen in the collection of Mr. J. Chappell, of Openshaw, which was caught at Holmes Chapel, and another from Dunham Park, in the possession of Mr. A. Salmon, of Bowdon. From December to March we have repeatedly taken this species in the old mines at Alderley Edge (T. A. Coward, Zool. 1888, p. 222; C. Oldham, Zool. 1893, p. 103). Copper was worked at Alderley in pre-Roman days, but the low galleries running horizontally into the sandstone rock, where we have found the bats, are of much more recent date. A dipterous insect and two moths (*Scotosia dubitata* and *Gonoptera libatrix*) are frequently found on the walls, and possibly



afford food for the bats. The Whiskered and Long-eared Bats, which are found in about equal numbers, do not crowd together for warmth like hibernating Noctules, but are scattered singly about the roof and walls, from which they generally hang head downwards, sometimes as much as 100 yards from the mouth of the tunnel. A Whiskered Bat taken on Dec. 26th, 1892, was not in the usual position, but wedged horizontally into a small crevice. When found, the bats are covered with moisture and are very cold and lethargic; but on being handled their temperature rises rapidly, and they become lively enough in the course of a few minutes. Whiskered Bats which we have taken home from Alderley have flown energetically about a room, but we have never been able to induce them to feed, and they have invariably died in a few days.

Order INSECTIVORA.—Family ERINACEIDÆ.

*Erinaceus europæus*, L.; Hedgehog.—Common and generally distributed. This species is accused by gamekeepers of destroying eggs and young birds, and is often caught in traps baited with flesh. The Hedgehog is perhaps more indifferent to the presence of man than most wild animals. Coward once came upon one in a dry ditch in Dunham Park, which smelt at his boots and looked up into his face for some minutes, but did not show any sign of fear until he handled it, when it rolled up and remained in that position for some time.

Family SORICIDÆ.

*Sorex araneus*, L.; Common Shrew; Nurserow; Nostral.—Common. We have had specimens from many widely separated localities. There is an albino from Picton in the Grosvenor Museum, Chester. The late J. F. Robinson, of Frodsham ('Manchester City News,' June 30th, 1883), thus describes the old superstition regarding the Shrew:—"I remember well a large ash-tree, which was known as the 'Rock of Ages.' It always puzzled me to know why the small ash twigs and young boughs were gathered and hung upon the shippon roof over the cows about calving time, to ensure freedom from disease, and it was some time before I found out the reason. It was a shrew-ash, and for several generations it was regarded by the villagers as a tree possessing remarkable virtues, because a wretched shrew-

mouse had been fastened in alive in an auger-hole made in the stem as a living tomb. . . . When the tree was sawn up several spots were revealed, marked by a brownish mass of decaying wood, where the harmless little animal had been thrust in by the superstitious farmers."

*Sorex minutus*, L.; Lesser Shrew.—Not so plentiful as *S. araneus*, but has probably been greatly overlooked. The first Lesser Shrew recorded from Cheshire was sent to us, in the flesh, on Jan. 24th, 1894, by Mr. Newman Neave, of Rainow, near Macclesfield, whose cat had brought it into the house a day or two previously. This specimen is now in the Owens College Museum, Manchester (N. Neave, Zool. 1894, p. 110; C. Oldham, 'Naturalist,' 1894, p. 130). A pellet of the Barn Owl, obtained at Great Budworth in May, 1894, contained one skull of this species and six of *S. araneus*. A second skull was obtained from an Owl's pellet found in Dunham Park in September, 1894. Mr. Oldfield Thomas, of the British Museum, has kindly confirmed our identification of these two skulls.

*Crossopus fodiens* (Pall.); Water Shrew.—In the district drained by the rivers Mersey and Bollin this species is decidedly common. Ashley, Baguley, Bowdon, Brooklands, Dunham, Gatley, Northenden, and Wythenshawe may be cited as localities. We have also seen it at Chelford, and found its skull in a Barn Owl's pellet from Great Budworth. Byerley gives one record only, "Taken at Egremont by Mr. R. Abbott." Mr. Newstead names Ince, Elton, and Hatchmere as localities where he has seen it.

An example described as an Oared Shrew (*S. remifer*, Geoff.), was taken many years ago at Birkenhead by Mr. Wm. Webster, jun., of Upton (Zool. 1848, p. 2009).

#### Family TALPIDÆ.

*Talpa europæa*, L.; Mole; Moudywarp.—Common and widely distributed. Occurs on the high ground in the east of the county, as well as throughout the Cheshire plain. Mr. Newstead mentions having seen "several specimens of a cream-colour with the under parts golden yellow," and there is an example of this variety from Saltney in the Grosvenor Museum, Chester.

## Order RODENTIA.—Family SCIURIDÆ.

*Sciurus vulgaris*, L.; Squirrel. — This species is very plentiful in Delamere Forest, and is common in the parks, woods, and coverts throughout the county. It is persecuted by gamekeepers, and may often be seen in their "museums." Oldham once watched a Squirrel for some time in a beech at Capesthorne. The road beneath the tree was covered with the half-ripened fruit which the little creature had dropped, and it was seen that where the involucre had been gnawed through so as to expose only one shrivelled and barren mast, the remaining masts were also barren; whereas fruits which, judging from the size of the cells, had contained well-developed masts, had been gnawed through independently on either side. The Squirrel is partial to mushrooms, and will also, occasionally at any rate, eat poisonous fungi (C. Wolley-Dod, 'Field,' Sept. 29th, 1893, p. 491).

## Family MYOXIDÆ.

*Muscardinus avellanarius* (L.); Dormouse. — The Dormouse has been recorded from several localities in Cheshire, and is probably more common than is generally supposed; but, owing to its nocturnal and retiring habits, and the secluded nature of its haunts, it is doubtless often overlooked. Byerley says, "Mr. Brockholes has seen it in Prenton Wood." Mr. Newstead, in his list, mentions one found by his father "in the hollow of an old apple-tree at Thornton-le-Moors in the autumn of 1885." Mr. Thomas Worthington informs us that he frequently met with this species at Peover from forty to fifty years ago, and we have reliable evidence that it is still to be found there. Mr. H. H. Corbett says (*in lit.*) that Dormice were common in the woods at Alderley about thirty years ago. Mr. J. Kenyon, Lord Eger-ton's head-keeper, states that he has occasionally found Dormice in the woods on the Tatton Estate. In the 'Manchester City News' for March 3rd, 1883, a short account of this species is given by J. F. Robinson, who says:—"It can be met with in the summer season at the foot of the Woodhouse Hills [near Frodsham] in sheltered sunny nooks, where I have found four nests, each containing young, all in a radius of three or four yards." One was captured in its nest in the Goyt Valley, above Errwood

Hall, on May 26th, 1890 :—"The nest was suspended from the bough of a fallen tree, and was perhaps eighteen inches or two feet from the ground" (N. Neave, *in lit.*).

#### Family MURIDÆ

*Microtus amphibius* (L.); Water Vole; Water Rat.—This species is common and generally distributed. In the winter of 1881–1882 Mr. E. Comber shot an example of the black variety at Parkgate, in Wirral (Zool. 1890, p. 384). Another was observed in the same neighbourhood in May, 1890, and Mr. King, of Carlisle, has met with this form on the banks of the

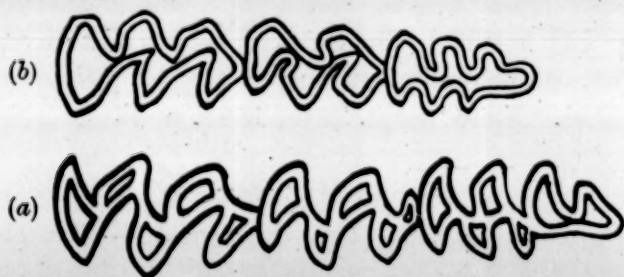


FIG. 1.—Right upper molars of (a) *agrestis*, (b) *glareolus*,  $\times 10\frac{1}{2}$ .

Dee (Macpherson and Aplin, Zool. 1892, p. 287). The Water Vole does not invariably bring forth its young in a burrow in the bank of some stream or pond. On June 25th, 1887, we found three spherical nests made of gnawed reeds and flags, placed on platforms of the same materials, which raised them above the water, in a reed-bed at Pickmere Mere. One of the nests contained four blind young ones, one of which was much darker in colour than the other three (C. Oldham, 'Naturalist,' 1892, p. 4).

*M. agrestis* (De Selys); Field Vole; Field Mouse.—Abundant and generally distributed. In the Grosvenor Museum, Chester, there are two pied examples from Cotton Edmunds, and an albino from Nantwich (Newstead). We have trapped this species in plantations, gardens, and hedgerows, but its usual habitat is the open fields, where, in some places, the turf is so honeycombed by its burrows as to resemble a miniature rabbit-warren. In Dunham Park, Field Voles form the staple food of



the Barn Owl. We have examined a great number of pellets from this locality, and have found only a few skulls of *glareolus*; whereas the skulls of *agrestis* exceed those of all the other mammals together. In old meadows this species is often so numerous as to be a perfect plague, not only on account of the amount it actually eats, but because its nests clog the knives of the mowing-machines when the grass is cut. In winter, holly-bushes may be seen in the hedgerows with the smaller twigs stripped of bark, and though in some cases the damage may be done by Bank Voles, in others the present species is certainly the culprit

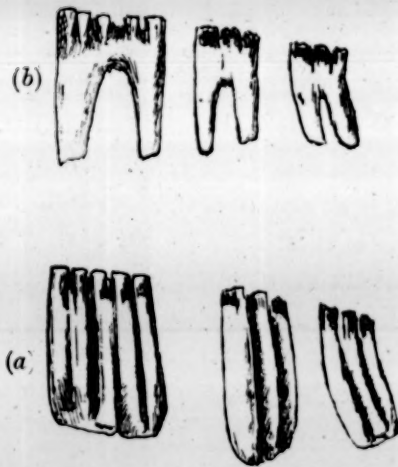


FIG. 2.—Lower molars of (a) *agrestis*, (b) *glareolus*,  $\times 5\frac{1}{2}$ .

(cf. Zool. 1890, p. 98). The abundance of this and the next species is doubtless to some extent due to the constant persecution of their natural enemies, Kestrels, Barn Owls, and Weasels.

*M. glareolus* (Schreb.); Bank Vole. — This species is common and generally distributed, but has been much overlooked in Cheshire, as is doubtless the case in other parts of the country. In the neighbourhood of Sale, Northenden, and Gatley, the Bank Vole is extremely numerous in hedge-banks where there is a sufficient amount of undergrowth to afford it the covert it delights in, and we have trapped as many as six in one hedgerow in a single night. The Rev. C. Wolley-Dod states (*in lit.*) that it is abundant at Edge, near Malpas. Mr. R. Newstead has sent us teeth taken from the stomach of a Kestrel from Eaton, and from

pellets of the same species from Aldford. We have received many specimens from Mr. N. Neave, taken at Rainow, near Macclesfield, and have trapped it in the same district at Higher Sutton, as well as at Brooklands, Bowdon, Ashley, Ringway, Lymm, Siddington, Chelford, Mouldsworth, and Parkgate. Its favourite haunts are hedge-banks and copses, but we have obtained specimens in gardens, and, at Gatley and Lymm, in osier-beds. By frequenting such situations it is less liable than *agrestis* to fall a prey to the Barn Owl, though we have found several skulls in pellets from Great Budworth, Dunham Park, and Wythenshawe. In traps baited with bread sprinkled with powdered aniseed this species is taken much more freely than *agrestis*, a result possibly due to its more omnivorous habits. The Bank Vole may be readily distinguished from the Field Vole by its slighter build, longer tail, and redder fur. The difference in the teeth is very marked (figs. 1, 2). In fully mature *glareolus* the grinders in both jaws are furnished with double roots, the teeth in the upper assuming this form at an earlier age than those in the lower jaw; whereas in *agrestis* the teeth retain their simple form throughout life. In the 2nd edition of Bell's 'British Quadrupeds' the number of cemental spaces in the second upper grinder is given as six, but, as a reference to the accompanying figures will show, there are four spaces in *glareolus* and five in *agrestis*. The angles of all the teeth in *glareolus* are much more rounded than in *agrestis*.

*Mus decumanus*, Pall.; Brown Rat. — This common and destructive species abounds everywhere, and is detested alike by the gamekeeper and farmer. Many are killed by Barn Owls, which should be encouraged, if only for this reason. Stoats and Weasels might keep them in check to some extent, but they are under the gamekeeper's ban themselves. In many places the hedge-banks are honeycombed by rat-holes, and the creatures may be met with in nearly every pond and ditch, as well as in game-coverts and about farm-buildings and houses. In Dunham Park they are exceedingly numerous, making their holes beneath the rhododendron-bushes. The large Pond-mussel (*Anodonta cygnea*) is eaten by this species, and we have often found shells with the margins of the valves bitten away; but it is not clear how the rats force open the shells, which are held together by very strong muscles.

*M. rattus*, L.; Black Rat. — Possibly lingers in a few places, but is very rare. Is still caught on shipboard in the Birkenhead Docks (F. H. Mills, Zool. 1894, p. 186). There is an old specimen without date in the Grosvenor Museum, Chester, from Aldersey. Mr. Newstead states:—"It is about five years since I heard of the species at Aldersey; at that time a resident told me it was then fairly common." In the 'Manchester City News' of Nov. 24th, 1883, J. F. Robinson describes the finding of skeletons of the Black Rat when some repairs were being made at Castle Park, Frodsham. He states that "the skins were reversed and drawn over the skulls," and adds, "This was a proof that they had been murdered by the Brown Rat"; but, as we have known a Barn Owl to treat a Brown Rat in exactly the same way, it is possible that owls were the destroyers.

*M. musculus*, L.; Common Mouse. — A common pest. We have trapped it in roadside-hedges at a considerable distance from houses or farm-buildings.

*M. sylvaticus*, L.; Long-tailed Field Mouse. — Generally distributed and abundant. There is a specimen of a pale buff variety in the Grosvenor Museum, Chester (Newstead). This mouse is very easily trapped. We caught one in Dunham Park only a few minutes after having removed a dead one from the trap.

*M. minutus*, Pall.; Harvest Mouse. — We can say nothing of this species from personal observation, and the evidence of its occurrence in Cheshire is of a meagre and unsatisfactory nature. Byerley says that it is found "not unfrequently in wheat-stacks, barns, and fields," but he gives no actual records, and we have been unable to obtain any evidence in support of his statement. The finding of nests in the reeds on Frodsham Marsh has been recorded in the columns of the 'Manchester City News' by J. F. Robinson. Mr. Sam Radcliffe, of Ashton-under-Lyne, informs us that some years ago he caught several examples on the premises of a hay and straw dealer in that town, who observed the mice in some straw which he had purchased on a farm near Wilmslow. Mr. Radcliffe kept some of the mice for several weeks in a large fern-case, where a female gave birth to a litter of young ones.

## Family LEPORIDÆ.

*Lepus europæus*, Pall.; Common Hare.—Common and generally distributed. Hares have become scarcer in some districts since the passing of the Ground Game Act.

*L. timidus*, L., *variabilis*, Pall.; Alpine Hare.—Restricted to the moors of the north-east, where it is abundant. Colonel J. Crompton Lees, of Oldham, has kindly furnished us with the following particulars of this species, which was introduced originally on his shooting at Greenfield, Yorkshire. He writes, under date June 29th, 1894:—"I believe fifty Blue Hares were turned out altogether in or about the years 1880, 1881, or 1882, and that they came from Perthshire. My keeper tells me that last March, when, of course, they were white, he counted about fifty as he sat in one spot. He used a pair of field-glasses. Some time in the sixties we turned out some Blue Hares, but they gradually decreased in number till they became quite extinct. I am happy to say the second attempt has proved successful." From Greenfield the hares have crossed the Cheshire border, and are now thoroughly established, and very plentiful on the higher parts of the moors in Longdendale, from Swineshaw, near Stalybridge, to Woodhead. In winter they sometimes come down on to the lower ground, and, after a thaw, are very conspicuous objects, looking like sheets of white paper scattered about the bare hill-sides. A specimen in the Grosvenor Museum, Chester, was shot on Featherbed Moss, about two miles above Crowden, on November 17th, 1894. It scaled 4 lbs. 10 oz., and had only partially assumed the winter dress, although on the same day that it was obtained one was seen almost entirely white.

*L. cuniculus*, L.; Rabbit. — Common. The black variety occurs sporadically, and is abundant in the large warrens at Lyme Park.

(To be continued.)

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## ON THE PROPER SPECIFIC NAME OF THE WEASEL.

BY OLDFIELD THOMAS, F.Z.S.

MANY years ago the late Mr. E. R. Alston told me he saw no escape from the necessity for using the specific name *nivalis*, Linn., for the Common Weasel; and though, so far as I know, he never carried this view into effect, nor, with the common laxity of authors in this respect, has any one else done so, with the exception of Scandinavian zoologists, the case seems to be so clear that, on the principle enunciated in my note on the Shrews (p. 62), I feel compelled to adopt the name Linnæus gave to the species.

Its synonymy would then stand as follows:—

PUTORIUS NIVALIS (Linn.).

*Mustela nivalis*, Linn. Syst. Nat. (12), i. 69, 1766; Hellenius, Retzius, Holmgren, Lilljeborg, &c.

*Mustela vulgaris*, Erxl. Syst. Regn. An. Mamm. p. 471, 1777; *et auctorum plurimorum*.

The name was given to a specimen found running about on the snow, and had no reference to the colour of the animal.

[The proposal to change a name which has been in use for nearly 120 years is one which probably most of our readers will agree ought not to be too hastily accepted; and before adopting the view above expressed it will be well to look into the matter a little more closely. Mr. Thomas says the case "seems to be so clear that he feels compelled to adopt the name Linnæus gave to the species." But the question arises, "Did Linnæus give the name to the species?" His "common Weasel" (the *Mustela vulgaris* of older authors) was evidently the Stoat, which he named *Mustela erminea*, and described as *Mustela pedibus fissis, caudæ apice atro*, with the tip of the tail black, an expression sufficiently diagnostic of the animal. What is his description of *M. nivalis*, which Mr. Thomas identifies with our Weasel? It is as follows:—" *Mustela pedibus fissis, corpore albo, caudæ apice vix pilis ullis nigris*;" in other words, an animal with a white body and with scarcely any black hairs (implying that it had some) in the tip of the tail. He refers to his previously published 'Fauna Suecica' (1761), and turning to the species numbered 18 in that work we find the same animal described as above, with the additional remark:—"Præcedenti simillima (i. e. *M. erminea*)

nivea, cauda etiam alba sed pilis tantum paucissimis extimis nigricantibus, nec toto caudæ apice nigris; corpus dimidio minus est *Erminea*."

In this country the expression *corpore albo* would not apply to our Weasel, which does not turn white in winter, though albino specimens are sometimes met with; but assuming that it does turn white occasionally in Scandinavia, there is still the difficulty of the black hairs in the tip of the tail, which would not be found in this animal at any season of the year, but are at all seasons characteristic of the Stoat. As regards the question of size, it is well known that with Weasels and Stoats the female is invariably smaller than the male. The conclusion then at which we arrive is that the *Mustela nivalis* of Linnæus is not our common Weasel, but a female Stoat in winter garb. We are not told on what evidence it appears that the name *nivalis* "was given to a specimen found running about on the snow." We find no mention of this either in the 'Systema Naturæ' (*l. c.*) or in the 'Fauna Suecica.' From what is there stated we infer that the term *nivalis* means "snowy white," and was deemed by Linnæus to be a good specific name for an animal which he described as *nivea*.

Whether the Common Weasel should be transferred from the genus *Mustela*, in which Linnæus placed it, to the genus *Putorius*, is a doubtful question, the discussion of which must be reserved for some future occasion.—Ed.]

## OBSERVATIONS ON BIRDS IN MID-WALES.

By J. H. SALTER.

(University College, Aberystwyth.)

(Continued from p. 143.)

### ACCIPITRES.

BARN OWL, *Strix flammea*. Not at all numerous.

LONG-EARED OWL, *Asio otus*. Fairly common, especially in the Nanteos woods.

SHORT-EARED OWL, *A. accipitrinus*. Occurs most commonly on Borth and Tregaron peat-bogs. About 1874 Capt. G. W. Cosens found several pairs breeding near Sir Pryse Pryse's lakes, and recorded the fact at the time in a letter to the 'Field.'

TAWNY OWL, *Syrnium aluco*. The most common and generally distributed of the Owls. While a friend of ours was examining a nest of young near Rhayader, one of the old birds flew against his back "as if a cricket-ball had struck him." Capt. Cosens disturbed one from a rabbit-burrow on putting in a ferret.

SPARROW HAWK, *Accipiter nisus*. Common. Seems when undisturbed to resort to the same nest year after year.

MARSH HARRIER, *Circus æruginosus*. Many years ago numerous about Borth and Tregaron bogs. Mr. Chas. Jeffreys, of Glandyfi Castle, remembers when the Moor Buzzard, "the dark brown Hawk with the light-coloured head," as well as the blue-grey Hen Harrier, were to be seen daily working over the salt-marsh below his house. Capt. G. W. Cosens has a young male bird, which was obtained on Borth Bog about 1870. Another was shot upon Tregaron Bog about 1882.

HEN HARRIER, *C. cyaneus*. Well known to those who have shot over Borth and Tregaron bogs, or the marshy flats of the Dysynni above Towyn, for Snipe and Ducks in winter. Mr. F. Abel speaks of it as "the only Hawk which hunts the ground regularly like a pointer." He has seen it strike at a Snipe, but without success. On Tregaron Bog the Ducks have been seen to make for the river and dive as the Harrier strikes at them. Capt. Cosens tells me that as he was watching some Teal upon the water a male bird came suddenly down upon them and carried one off. I saw a Ring-tail quartering the bog on June 8th, 1892. An adult male and dark-coloured young bird are preserved at Nanteos.

MONTAGU'S HARRIER, *C. cineraceus*. Mr. F. T. Fielden, of Borth, has an adult female, which he obtained November 5th, 1888. It weighed  $9\frac{1}{2}$  oz.; length,  $18\frac{3}{4}$  in. The irides were bright straw-yellow.

BUZZARD, *Buteo vulgaris*. Does not breed within a dozen miles of Aberystwyth, but in the wilder hill districts is still to be found in all suitable localities. A dozen pairs probably nest within a three-mile radius of a remote sheep farm which we have occasionally made our head-quarters. We have seen three pairs in the course of a morning upon the upper Wye, working in a slow, business-like way along the rocky slopes, probably in search of beetles and earth-worms. One in the Brecon Beacons, March 29th, 1894. The Buzzard is always to be seen on Cader Idris. It does not now breed upon the Bird Rock, owing to persecution; was very numerous in that neighbourhood till about 1876, when, strict game-preserving coming into vogue at Peniarth Uchaf, many were destroyed, "up to nine in one week." Three eggs were taken in 1894 from a nest within sight of the

Bird Rock; one of them, now in my possession, is exceptionally well-marked. The Buzzard allows itself to be shot or trapped at all times with the greatest ease. The hen bird will sit till one is within a few yards of the nest. I have sometimes seen a Buzzard cross the valley with half-folded wings, and it occasionally hovers, looking for the moment like a giant Kestrel. On fine evenings at sunset the Buzzards soar as if to enjoy the last rays of the light. They are constantly harassed and beset by Crows. The farmers do not view them with favour on account of the occasional loss of a newly-hatched chicken. Nest-building begins at the end of March, rocks being generally chosen in this district, but exceptionally a tree. The site can usually be reached without the least difficulty. A nest containing two eggs on May 21st, 1893, was garnished with fresh-pulled leafy twigs of birch and mountain ash. Another nest, on the 23rd, contained three young ones about a week old; and provision in the shape of a shrew, a mouse, and a piece of sheep intestine. Later, the nest contained pellets and the remains of a crow. A nesting-ledge, which I inspected on May 6th, 1894, was about a yard across, littered with bits of stick and sedge, with a slight grass-lined hollow in the middle for the two eggs. The old birds hovered overhead, mewing piercingly and persistently. A pair near Plynlimmon on May 30th, 1894, showed no signs of having a nest.

ROUGH-LEGGED BUZZARD, *B. lagopus*. Only one, or possibly two, occurrences.

PEREGRINE FALCON, *Falco peregrinus*. Appears to be banished from most of its former breeding-places, as on the cliff between Aberystwyth and Borth, in the colony of Herring Gulls between Aberaeron and New Quay, and on the Bird Rock. At the latter locality, where it was long tolerated, Mr. Hutchings has seen it strike down Jackdaws, and, on picking them up, has found the back torn by the claw of the hind toe, with which alone the stroke seemed to be given. Mr. F. Abel tells me that one caught up a Teal which he had wounded. Their existence here was at last considered incompatible with the rearing of Pheasants at Peniarth Uchaf, so in 1888 the male bird was shot. The female went away, and shortly returned with another mate; both were shot, and the three eggs taken. Since this date the Bird Rock has been falconless. There was a nest upon the cliff some six miles south of Aberystwyth till 1893, when I believe the young birds



were destroyed; and this year I could see nothing of Falcons here or elsewhere. In June I did not meet with any in walking along the whole of the Cardiganshire coast. Inland there was formerly a nest upon a crag in one of the tributary dales of the upper Towy; and in March, 1894, a Falcon revisited this locality. In autumn and winter the species is less local, and there have been numerous occurrences.

MERLIN, *F. aesalon*. Not uncommon in autumn and winter, especially about the salt-marshes of the Dovey. Doubtless breeds on Borth and Tregaron bogs.

HOBBY, *F. subbuteo*. One seen by Capt. G. W. Cosens flying over his house at Llanbadarn in September, 1891.

KESTREL, *F. tinnunculus*. Breeds commonly in the cliffs, both on the coast and in the rocky dales of the Wye and Towy. Some eggs found in 1892 were compared with others taken from the same hole in 1882, and were evidently the produce of the same bird. I have seen the eggs in a hole in a quarry laid on the bare stone without a trace of nesting material. Kestrels killed many small birds during frost, January 9th to 12th, 1892. At Hafod, on April 5th, 1894, one rose hastily from the ground, leaving the tail of a lizard, which continued to wriggle for about an hour.

WHITE-TAILED EAGLE, *Haliaeetus albicilla*. An Eagle, no doubt of this species, was seen by Mr. F. Abel at the Bird Rock on two consecutive days between the 15th and 20th of November, 1881 or 1882. The weather was very bad and rough at the time. On the second occasion, when it was also seen by several members of a shooting party, it left the rock, and flew in the direction of Barmouth.

KITE, *Milvus iclinus*. Well known to all whose recollection of Mid-Wales extends back forty or fifty years. At the present day it is doubtful if more than seven or eight pairs are left in the Principality. I know of no recent instance of the Kite having nested in Cardiganshire. At Devil's Bridge, which was formerly a favourite haunt, I hear of thirteen having been seen upon the wing at once. The last nest in this locality was about 1860. The female was shot from the nest, and the eggs taken. Two young birds from the same neighbourhood were brought to Nanteos. The female, after killing her companion, lived there for about twenty years in captivity, and laid one egg. The Kite wanders to

some extent, and occasionally revisits its old haunts. Mr. F. Abel tells me that old people remember that the Kite used to breed on the Bird Rock, and informs me that one haunted the woods at Peniarth Uchaf from November, 1893, to March, 1894. Mr. F. T. Fielden obtained a fine male bird at Glandovey on August 15th, 1889. When first seen it was mobbed by Crows. He also observed one at the Teifi Pools in April, 1894. A Kite is preserved at Falcondale, and another has been seen over Tregaron Bog. Other localities had better be withheld in the interest of the birds; but I may add some details to those already given in 'The Zoologist' as to the nesting of this fast-disappearing species. On March 26th, 1894, a pair were reported to be building in a small wood of thin oaks, where for some years they have persisted in attempting to nest in full view of a neighbouring farm. I was not able to visit this locality till May 6th. The nest was soon found, but was empty, the eggs having evidently been taken. A specimen of the lining included a piece of coarse sacking, old newspaper, and tobacco-paper. Near at hand was last year's nest, and at no great distance a third older nest. In the latter were two or three pen-feathers, showing that it had held young Kites, probably in 1892. While this investigation was in progress, a Kite passed over the wood. Passing a bold wooded bluff at the junction of three valleys,—a great meeting-place for Kites, Buzzards, Ravens, and Carrion Crows, and the scene of constant aerial skirmishing,—we mounted to a wooded gulley, above which a pair of Kites soon appeared. They were silent, but their animated flight, which I had never seen to such advantage, showed their interest in our approach. As they rose or dipped behind the sky-line, the forked tail was now closed, now spread, and inclined to one side or the other with each easy and graceful turn. The nest proved to be one in which we had found young Carrion Crows last year. It had been enlarged and repaired, and by climbing the slope I could look into it, thus ascertaining that it contained one egg. This was no doubt the second attempt at breeding of the pair whose nest we had seen previously. Report spoke of a second pair in a neighbouring valley. A farmer told me that he remembered an instance of the Kite, in general a tree-builder, having nested upon the rocks.

## GALLINÆ.

RED GROUSE, *Lagopus scoticus*. Grouse are in general very scarce upon the grass-grown uplands of Mid-Wales. If met with at all, it is generally where the crowberry (*Empetrum nigrum*) grows. In a few spots where heather flourishes, as on the Elan Moors near Rhayader, and the low-lying Teifi Bog, grouse are correspondingly plentiful.

BLACK GROUSE, *Tetrao tetrix*. Probably extinct as a resident in Cardiganshire. Said to have been formerly found on Borth Bog, and may revisit that locality, as about 1886 Mr. F. T. Fielden saw a solitary Grey Hen. I am told that Black Game were introduced at Crosswood by the grandfather of the present Lord Lisburne. All wandered or were shot off, with the exception of a single Grey Hen, which was supposed to have bred with a Red Grouse, as a bird which was taken to be a hybrid between the two was obtained. On the Gogerddan property one or two are still obtained almost every shooting season. They are supposed to cross the hills from Radnorshire, where there are some about Cwm Elan.

PHEASANT, *Phasianus colchicus*. Owing to the nature of the country, Pheasant-preserving is not general. A few wild-bred birds, without the white ring, are still met with.

RED-LEGGED PARTRIDGE, *Caccabis rufa*. Eggs have been hatched out in Cardiganshire from time to time, but the species has never established itself.

PARTRIDGE, *Perdix cinerea*. Fairly plentiful, considering the small amount of arable land.

QUAIL, *Coturnix communis*. Met with almost every season, and in some years exceptionally numerous. I heard of two coveys near Borth in 1893. Years ago a shooting season seldom passed without ten or twelve couples being obtained on the Gogerddan estates.

## HERODIONES.

HERON, *Ardea cinerea*. A few always on the Dovey, while others fish the small streams in the hills. There are no large heronries, but about eight pairs of birds, carefully protected by the owner, Mr. J. Parry, breed at Llidiardau, Llanilar. About the same number nest at Peniarth, above Towyn, in very tall larches. A few pairs have bred in the rookery at Talgarth near Machynlleth, sharing some Scotch firs with the Rooks; but last

spring the nests appeared to be unoccupied. A fine old Heron, preserved at Gogerddan, has the greater part of the back and wings white.

**LITTLE BITTERN**, *Ardetta minuta*. An example, shot about forty years ago near Lodge Park by the late Mr. Jeffreys, of Glandyfi Castle, is now in the possession of the Viscountess Parker.

**BITTERN**, *Botaurus stellaris*. The two large bogs, which form the most interesting feature of the county from an ornithological point of view,—the Gors Fochno, stretching inland from Borth, and the Gors Teifi near Tregaron,—must formerly have been favourite haunts of this bird. They are revisited almost annually, as Mr. Hutchings receives Bitterns for preservation whenever a few days of hard frost occur. During frost in the first week of January, 1894, five or six were received, chiefly from these two localities; and one occurred about the same time at Peniarth, near Towyn. I was shown a spring upon the margin of the Teifi Bog, which had been frequented by an "Aderyn y Bwn" for some days. The only one received during the present winter was sent from Borth on December 10th. There are stuffed Bitterns at Bronpadarn, Lodge Park, Pen-y-bont-pren, &c. The shooting parties used to meet with about half a dozen in the neighbourhood of Borth Bog every winter.

**SPOONBILL**, *Platalea leucorodia*. A not infrequent visitor, generally to the Dovey. One was shot near Aberystwyth about 1838. About 1879 one frequented the Dovey for three months, and, though often tried for, was never shot. In the autumn of 1891 Mr. F. T. Fielden had a perfect view of a Spoonbill, which he stalked to within thirty yards. A Herring Gull swooped at it screaming, and put it up, and to this it owed its escape. Mr. Hutchings believes that he has received four at long intervals. A specimen, shot by the late Mr. Jeffreys, of Glandyfi Castle, about 1855, is still preserved there. It was seen to alight in the river in company with seven Sheldrakes. Mr. Chas. Jeffreys tells me that on May 16th, 1893, a flock of fourteen Spoonbills settled in the river nearly opposite the castle. He watched them through a glass running about restlessly on a sandy spit, and wading off to a mud-bank, shovelling up the ooze with their bills. They spent most of the day here, and were not shot at, but were seen to go off towards evening.

(To be continued.)



## NOTES AND QUERIES.

The Manuscript of White's 'Selborne.'—The sale by auction of this manuscript, announced in our last number (p. 147), took place in London, at the rooms of Messrs. Sotheby, Wilkinson and Hodge, on the 26th April last. It was put up at £100, and the bidding having advanced gradually to £294 (or two hundred and eighty guineas), it was knocked down for that sum to Mr. J. Pearson, who, it was understood, purchased it on commission for Mr. S. M. Samuel, of No. 6, Palace Court, W.

## MAMMALIA.

Irish Hare turning white in Winter.—I was surprised to see the discussion of this subject in the pages of 'The Zoologist,' as I imagined that most people had now learnt that the often-repeated statements in Natural Histories, such as that "in Ireland, doubtless owing to the mild climate, the Mountain Hare does not turn white in winter" (*vide* Lydekker, Brit. Mammals, pp. 226-7), are not true. Ever since the time of William Thompson (Nat. Hist. of Ireland, p. 28) it has been known to Irish naturalists that the Irish Hare *can* and often *does* undergo a considerable change in winter; the amount of the change, no doubt, depending on weather and other conditions; and the late Mr. A. E. Knox has stated that Irish Hares introduced into Petworth Park, Sussex (as I am informed by Prof. Newton), kept up their former habit of turning white in winter for several seasons—a fact which I have also noticed myself in the case of Mountain Hares from Wicklow when turned down on the lowlands of Wexford. I have for years been collecting information on this and other matters relative to the Irish Hare, and have even taken the trouble to collect facts by means of a circular sent round to many game-preservers, or their keepers, in Ireland, and I have not the slightest doubt that some Hares which have turned nearly quite white are to be found *every* season in Ireland. Pure white Hares are no doubt rarer, but have certainly been recorded (*vide* Thompson *loc. cit.* and G. H. Kinahan in 'Land and Water,' March 3rd, 1891), but it seems to me that the really important point to notice is not whether *any* Hare has ever turned quite white in Ireland in winter, but that in Ireland it is the exception for a Hare to do so, or even to turn nearly white, whereas in Scotland it appears to be the rule. I may add that in mountainous parts of Ireland even leverets can partially undergo the winter change, as evidenced by a leveret in my own collection which was sent me by Mr. John Hunter, of Wooden Bridge, Co. Wicklow.—G. E. H. BARRETT-HAMILTON (Trinity College, Cambridge).

In addition to the evidence already adduced on this subject (pp. 104, 149), I may state that in February, 1894, I saw a perfectly white Hare

near the top of Derryclare, one of the mountains known as the Twelve Pins, in Connemara, where I was told at the time that this was not uncommon, and that a few years previously two entirely white Hares had been seen on Cashel Hill. — G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

**The Irish Stoat.**—What is a barbarous name? It is surely somewhat late in the day for the Editor of 'The Zoologist' to protest against the use of native names for animals. According to the arguments put forth against *Assogue*, &c., in the editorial note to the description of the Irish Stoat in last month's 'Zoologist' (p. 129), we should not use "Wapiti" nor "Kudu," and so on. In fact, about one half of the names in general use for animals are not real original English words, but engrafted native names, adopted from every language under the sun, and none the worse on that account. Indeed native names are the best colloquial terms possible when properly applied, and English compounds the most clumsy and unsuitable, besides being generally uncertain in their application, and nearly always involving a false or doubtful assumption about affinity. The mode of spelling is of course a different question, on which opinions may be very naturally divided. To me it seemed that *Easóg* is too strange-looking and unpronounceable a word for any Englishman to adopt, while *Assogue* would perhaps have a chance of surviving, and we should then have the convenience of three names for three species. I may add that I am personally entirely responsible for the name proposed, as my colleague, Mr. Barrett-Hamilton, was at the time of writing the paragraph beyond the reach of consultation. Like the Editor, I should certainly not "admit that the spelling of an Irish name as it is pronounced makes it English." What makes it English, as in the case of Wapiti, Kudu, Antelope, and others, is its use by English people in English books.—OLDFIELD THOMAS.

[Mr. Thomas seems to have misunderstood the drift of our remarks (p. 129). Our objection was not to the use of the native name *Easóg*, which is on a par with *Wapiti* and *Kudu* as above quoted, but to *assogue*, which is neither Irish nor English, and hence in our opinion "barbarous." —ED.]

**Polecat in Cambridgeshire.**—The following is from the 'Ipswich Journal' of Feb. 23rd, 1895, and may perhaps be worth publication in 'The Zoologist,' if only to show that the Polecat is not yet exterminated on the Cambridgeshire and Suffolk borders:—"At Isleham, in the Cambridgeshire Fens, a Polecat was found by the lock-keeper with its feet frozen to the top of the lock-gate. It had evidently stopped on the gate to watch some object of prey."—G. T. ROPE (Blaxhall, Wickham Market).

**Food of the Bank Vole.**—When staying at Chollerton, on the North Tyne, for a few days after Christmas, I noticed under a hawthorn hedge a

number of little heaps (in some places an inch in depth) of haw-pips and haw-rind, in many cases at the mouths of small holes in the bank, in other cases in the grass close to a network of runs which extended all over the hedge-bank. The pips were gnawed in on one side and the kernels extracted. Being anxious to ascertain what species of Mouse was responsible for this, I set a few small traps at the mouths of these holes and captured four specimens of the Bank Vole, *Arvicola glareolus*. Bell states that the food consists of fruit and roots, carrion, insects, worms, and snails; and in confinement some Bank Voles he possessed showed a partiality for gooseberries. It seems to me that, from the nature of its haunts, the fruit of the hawthorn (both kernel and mesocarp) forms a very much larger portion of its diet than has been hitherto suspected. In his description of the Bank Vole, Bell mentions that it is a good climber. It would be interesting to ascertain whether this little rodent climbs the hawthorn for the haws, and whether its tail is prehensile. No doubt a few berries which had fallen would be scattered about under the hedge, but in the case which came under my immediate notice the quantity of fragments of those eaten was so considerable as to suggest that the little fellows had had many a climb to obtain their food.—JOHN H. TEESDALE (St. Margaret's, W. Dulwich).

[The Bank Vole is an expert climber, but the tail is not prehensile in this or any other species of Vole.—ED.]

**Note on the Long-tailed Field Mouse.**—It may be well to place on record the occurrence, at Ashford, Kent, of the Mouse described by Mr. de Winton (Zool. 1894, p. 441) as *Mus flavicollis*. I caught a specimen answering to his description in a hollow hazel-stump in which I had previously taken the typical *Mus sylvaticus*. In the flesh this animal appeared strikingly different from the common form.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

[The fact of this specimen having been found in a hole from which a typical *Mus sylvaticus* had been taken somewhat conflicts with Mr. de Winton's view that the two forms do not associate, and we must confess that we are not yet assured of their specific distinctness. We may add that on March 12th last we received a specimen of the so-called *flavicollis* from the neighbourhood of Malvern. The head and body measured 4 in., the tail  $3\frac{1}{2}$  in.—ED.]

#### BIRDS.

**Notes on the Grouse.**—Mr. Macpherson assures me that I am mistaken in attributing to him (p. 107) an opinion that Red Grouse do not migrate seasonally. Looking again at the passage to which I referred (in "The Grouse," Fur and Feather Series) it seems a natural interpretation to put upon his words, but I of course express my regret that I have misunderstood him.—HENRY H. SLATER (Thornhaugh Rectory, Wansford).

**The Little Auk in Scotland.**—I see in the April number of 'The Zoologist' (p. 151) a notice of the paper I read last month to the Natural History Society of Glasgow. Most unfortunately the report in the press on which your notice is based was very inaccurate, but I did not think it necessary to correct it, as I trusted to the circulation of the paper as a reprint among those interested to set it right. I send a copy herewith. You will see from it (1) that through Mr. Eagle Clarke I knew of the occurrences in the Outer Hebrides; (2) that the Ayrshire occurrences were well known to me, as I had collected the information, and in turn had passed it on to Mr. Clarke; (3) that while agreeing that some of the specimens found in East Clyde came *via* Forth, I cannot believe that those occurring so commonly in the immediate vicinity of Oban and Islay reached there from such a source. As regards their frequency in the line of the Great Glen, Mr. Bisshopp, of Oban, had twenty-six birds, chiefly brought to him by boys who had found them near that town; while in Islay they became common all at once "everywhere on the coast, and even far inland." To this there was no parallel in the Clyde faunal area, and the vastly greater population and the general interest which the press notices of the Little Auk excited would doubtless have led to their being observed. It is not unusual for a few birds of this species to be met with in ordinary winters in Argyllshire or Ayrshire. It would be idle on the part of any one to insist that they come *via* Forth.—JOHN PATERSON (83, Cumming Drive, Glasgow).

[Having received by post a long and detailed printed report of the meeting at which the paper in question was read, we naturally concluded that it was duly authorised.—ED.]

**Manx Shearwater in Carnarvonshire.**—In the early part of June, 1893, I visited the locality in Carnarvonshire where Mr. Coward found the dead bodies of the Manx Shearwaters, as described (p. 72). As the greater number of the bodies were lying at the mouths of rabbit-burrows on the top of a grass-covered sandy cliff, I fail to see how the birds could have met their death by being driven by strong winds against the cliff, as suggested by Mr. J. H. Gurney (p. 110). The conclusion I came to was similar to that arrived at independently by Mr. Coward, *viz.*, that men, ferreting for rabbits, had come across the Manx Shearwaters in the burrows, and slaughtered them. I am satisfied that the natives of that part of Wales who collect sea-birds' eggs had not up to that time found out how and where to obtain the eggs of the Manx Shearwater, for I used to join them in their egg-collecting expeditions, and they allowed me to act as one of themselves, sometimes at one end of the rope, sometimes at the other, this leading to awkward situations sometimes, as only one of their number could speak English, and I am ignorant of Welsh. I questioned them closely, through the interpreter, as to the "Mackerel Cocks," but they appeared to be quite ignorant of their nesting-habits. Moreover there is in



those parts a local dealer in eggs, to whom the collectors bring their spoils. He had never received any Manx Shearwaters' eggs. When in the shop of Mr. Rawlings, chemist, of Barmouth, I saw some eggs of the Manx Shearwater, which he informed me had been taken in 1893 at Bardsey Island. From what I saw for myself, I quite agree with Mr. Coward that the Manx Shearwater does breed on that part of the mainland of the coast of Carnarvonshire, and before seeing Mr. Coward's article I had intended to re-visit the spot, and endeavour to discover a living Manx Shearwater and its egg in one of those rabbit-burrows, and then communicate the fact to 'The Zoologist.'—E. W. H. BLAGG (Cheadle, Staffordshire).

In the March number of 'The Zoologist' (p. 110), Mr. Gurney suggests that the Shearwaters which we found dead on the cliffs of Carnarvonshire had been killed by being dashed against the cliffs. This I feel certain was not the case, for the birds were lying on the soft turf-slope close to the holes in which they evidently had been breeding, and not only were their necks broken, but in many cases the heads were torn off, and lay some distance from the bodies; and in other cases the heads were twisted completely round, and loose feathers from the necks lay beside them. Several birds killed in the same manner lay in a field on the landward side of a turf-wall, and, as I mentioned, one bird was dead in a hole that had been dug out with a spade. The interest of the occurrence, of course, lay in the fact of their breeding on the mainland, not in the fact that they had been killed there by some person or persons unknown.—T. A. COWARD (Higher Down, Bowdon).

**Hen Harrier in Sussex.**—It may interest some of your Sussex readers to know that on March 21st I received a good male Hen Harrier in the flesh from Balcombe, Sussex, with the information that the bird was killed there on March 19th by the sender, who had never seen one like it before, and did not know what it was. I have hardly any personal acquaintance with Sussex, but the Hen Harrier has become so rare over the greater part of England that I consider this occurrence as worthy of record.—LILFORD (Lilford Hall, Oundle).

**Distribution of the Pomatorhine Skua in Summer.**—Referring to Col. Feilden's note on this subject (p. 172), I may state that on the 25th July last I was midway between the Färoes and Iceland in the Danish mail-boat 'Thyra,' and my log contains the following entry:—"A surprising number of Richardson's Skuas round the ship, mixed with a larger species (probably Pomatorhines, but none of these came quite close enough to me for identification) in the proportion of about six to one. Sometimes a flock of some seventy individuals together. This lasted till the afternoon." The Pomatorhine Skua has never been known to breed in Iceland, where Richardson's Skua is abundant and everywhere distributed. I should be

inclined to think that these large flocks were very leisurely moving southwards for the winter, influenced a good deal by the winds and the plentifulness of food. In southward migrations it is by no means uncommon for a certain proportion of old birds to accompany the first flights. In fact, the experience of a good many autumns on the Yorkshire coast has shown me that the first Grey Plovers, for example, to appear are old birds in small parties, still more or less in summer plumage. And the same with Sanderlings and Curlew Sandpipers.—HENRY H. SLATER (Wansford).

**Sandwich Terns on the Upper Thames.**—A visit from eight adult Sandwich Terns, on April 10th, was quite a novelty to this neighbourhood. They arrived before 9 a.m., and the greater part of the day was spent exactly opposite this house, sitting on the hand-rail of the bucks and the piles on the weir. The day was warm and bright, with a fresh westerly breeze, and the Terns were careful always to sit facing accurately to windward. At frequent intervals one or more would take short flights, in beats of perhaps 100 yards, in quest of fish, for which they plunged down from a fair height, with the wings about two-thirds expanded, and always side to wind. Early in the afternoon they moved half to three-quarters of a mile further up the river, where, there being no convenient perches, they spent, I believe, their whole time on the wing. About 4.45 p.m. six of them returned to the rail and piles on Marlow Weir; whether the other pair had separated voluntarily, or whether powder and shot had put an end to their wanderings, I do not know. During the morning any attempt by a second bird to share a pile already occupied by one had been successfully resented by the tenant, but now a pair shared a pile more than once, and they combined to prevent the intrusion of a third individual. I did not see them leave, but I satisfied myself, with the help of a good night-glass, before going to bed, that they were not roosting on the piles or elsewhere thereabouts, and have not seen or heard of them since. The Common Tern is entitled, I think, to be classed as an annual visitor to the Upper Thames, and the Little and Black Terns are also frequent visitors. The Arctic Tern, which is recorded in Clark-Kennedy's 'Birds of Berks and Bucks' as "occasionally obtained" in these counties, I have never myself seen on the river, or at least distinguished from *Sterna fluviatilis*; while the Sandwich Tern is not mentioned by him. Mr. Aplin, in his 'Birds of Oxfordshire,' mentions it as "a rare visitor," and enumerates about six examples obtained in the neighbourhood of Oxford between 1847 and 1879. These may all have come from the West, and did not necessarily pass this neighbourhood; while it seems natural to suppose that those which lately visited Marlow flew up wind from the mouth of the river. Another point noticeable about this visitation is the number of birds which appeared, forming the largest party of sea-birds that I have ever seen up the river, where such stragglers usually appear singly. — ALFRED HENEAGE COCKS (Great Marlow, Bucks).

[We have little doubt that these birds came up the Thames from the mouth of the river, for about that date we had reports of several large "Sea Swallows" being observed between Chertsey and Laleham. The species not being identified, we supposed them to be Common Terns.—ED.]

**The Raven on Sheep Farms.**—Mr. Salter, writing of the Raven in Mid-Wales, remarks (p. 139):—"There is a general impression amongst the farmers that the Raven will tamper with a sheep when in difficulties, and that its misdeeds at lambing-time are of the blackest description." This impression seems to be shared by ornithologists, for Mr. Howard Saunders refers to the Raven's "depredations among lambs, weakly ewes, and game," as an established fact ('Manual of Brit. Birds,' p. 232); and Prof. Newton, though lending the weight of his own personal experience to the contrary opinion, nevertheless endorses the view that in the wilder and mountainous parts of Britain "considerable loss is inflicted by the Raven on the owners of sheep" ('Yarrell's Brit. Birds,' ed. 4, vol. ii. p. 260; and 'Dict. Birds,' p. 737, note). Without prejudice to the result of observations in other parts of Britain, I venture to express my firm belief that on hill-farms in the Highlands of Scotland our Raven is simply a scavenger, inflicting on sheep-owners no loss of any kind whatever. Practical work in a pastoral district, where Ravens have bred from immemorial time, has convinced me (1) that neither Crow nor Raven will approach a living sheep or lamb unless the animal be *in articulo mortis*; (2) that neither Crow nor Raven, albeit they pick out the eyes, will commence to tear a carcase till the animal has been dead for hours, sometimes for days; (3) that neither Crow nor Raven will meddle with a lambing ewe, even in the rare event of difficult parturition, it being their constant habit to wait on death. I class the birds together here because in practice one cannot distinguish their work, and I put the Crow first because, in comparison with the larger bird, I have found it bold, bloodthirsty, and persistent. For nine years past a pair of Ravens have made their head-quarters, and reared an annual brood, in the rocky escarpment of a green hill-face which rises abruptly above my house, and is heavily stocked with black-faced ewes. Other pairs breed in the wilder country to the north. Much of my own ground can be "spied" from the windows of the house, but I have traversed the whole of it at all times and seasons, and especially at lambing-time, when the Raven's alleged misdeeds are said to reach a climax of iniquity. Of such misdeeds I have found no trace. I have never seen a living sheep or lamb with a vacant orbit, except in a single case when the dying animal just breathed; I have never detected a sign of visceral disruption on a warm carcase, nor surprised the birds at work on anything but carrion; and I have known a lambing ewe labour heavily for a couple of hours quite unmolested, though the expectant Crows were tearing at the placental membrane a moment after the passing shepherd had relieved and removed the ewe. In the spring of

1892 the immediate neighbourhood of two pairs of Ravens was found compatible with eighteen pairs of twin lambs safely delivered and all surviving. The circumstance that an incoming tenant and a stock valuation made every living lamb at that particular time worth a possible 15s. should stand as a fairly practical test of my faith in the innocence of Ravens. Three facts in this connection are not, I think, sufficiently considered. (1) The rough-and-ready pathology of hill-sheep recognises no half-way house of sickness, with possible convalescence, between health and death; it must be one thing or the other. A sick sheep on the hill is to all intents and purposes a dead sheep, worth nothing but the fleece, at most the "braxy," and a careful shepherd should always anticipate the scavengers to this extent. The loss of an eye may add to the pangs of a dying animal, but it takes nothing from the owner of the flock. (2) Hill-ewes lamb easily, rapidly, and without assistance. Still-born lambs are rare, and ewes that die in labour quite exceptional. The lamb is on its legs at once, and the ewe's awakened instinct of maternity constitutes a safeguard which must be seen to be believed. The stoop of the Golden Eagle at an unsuspected moment I should conceive to be irresistible, though I have never seen it; but mother ewes are much too quick for the more deliberate Crows, which, on all occasions when I have observed them, approach their quarry with considerable circumspection. (3) The natural death-rate of a hill-flock provides carrion enough and to spare for many scavengers. Taking the distribution of sheep-ground in the Highlands at from three to eight acres per sheep, and the normal death-rate of adult sheep—not counting hogs that die at winterings—at from 5 to 15 per cent. per annum, we get an average carrion output of a dozen carcasses per square mile per annum, thirty square miles giving a carcass for every day in the year, and this without reckoning the death-rate of lambs from birth (April) to weaning (August), which is understated at 10 per cent. for those four months alone. The numbers actually exceed this calculation on many west-coast farms, where a heavy death-rate follows in the wake of a heavy stock; but in any case Ravens need not kill their own meat, for nature keeps them constantly supplied. Sometimes a rotting carcass prompts one to believe that the supply is in excess of the demand.—ALLAN GORDON CAMERON (Barcaldine Castle, Ledaig, N.B.)

**Larus ridibundus: Assumption of the Hood in Winter.**—On Jan. 23rd last, a wild and boisterous day, with strong north-west wind and driving showers of sleet and hail, large flights of Gulls were blown inland, and were following the ploughs at work in the fields. Driving in the neighbourhood of Wells, Norfolk, I noticed, amongst a flock largely composed of Black-headed Gulls, one with an entirely black hood, which showed very plainly against the falling snow. I am aware that this early assumption of the breeding plumage has been observed at quite as early a date, but it is by no means of common occurrence.—H. W. FEILDEN.



**The Birds of Surrey.**—As I hope to publish a book on this subject as soon as the material collected is as complete as possible, I should be much obliged if any of your readers would draw my attention to any rare local occurrences; notes in local newspapers; local lists; old books or MSS. relating to Surrey birds; public or private local collections; names of any correspondents likely to assist; local names of species; personal observations, or any matters of local ornithological interest. I should also be glad to know whether the late Messrs. James Lewcock and Mansell, of Farnham, left any manuscripts or published lists of birds. Communications on any of these points will be gratefully accepted.—J. A. BUCKNILL (Hylands House, Epsom).

**Sale of Great Auk and Egg.**—The collection of birds' eggs and nests formed by Mr. Leopold Field was disposed of by auction at the well-known rooms of Mr. Stevens, in King Street, Covent Garden, on the 22nd and 23rd April last. The feature of the second day's sale was the inclusion of a very well-preserved specimen of *Alca impennis* (lot 260), with an egg (lot 261), both the property of Sir Frederick Milner, Bart., M.P., who inherited them with the collection of the late Sir William Milner. The history of lot 260, as printed in the sale catalogue, is altogether misleading, and the statement by Graham of York, to the effect that the bird was taken in the Orkneys, was (like other statements made by that dealer in regard to rare birds) wholly unreliable, although very likely credited by the late Sir William Milner. The specimen in question is in all probability the bird which Mr. A. D. Bartlett bought from a stranger for a "Northern Diver," and sold in September, 1844, to Shaw of Shrewsbury, who in turn disposed of it to Mr. Buddicom of Smethcote, Shrewsbury, from whom it passed, through Gardner, to Graham of York, who sold it to Sir William Milner as having been killed in Orkney! Having been recently re-stuffed by Cullingford of Durham, who certified to its being "a genuine specimen throughout, with not a single false feather in it," it was offered for sale as announced, on April 23rd. The bidding commenced at £100, and proceeded gradually to £350; at this point, no further bid being obtainable, the auctioneer declared it to have been bought in by the owner at £360, the reserved price not having been reached. We have since learnt that it has been sold for the Museum of Science and Art, Edinburgh, for £350. With regard to the egg (lot 261) above mentioned, the sale catalogue gives no indication of its history; but we are enabled to state, on the authority of the late Mr. Robert Champley of Scarborough, that on the 10th August, 1860, he met Sir William Milner by appointment; that Sir William then showed him this egg, and allowed him to make a water-colour sketch of it (which we have seen), and at the same time informed him that while staying at Heidelberg (qu. Dusseldorf), in the autumn of 1847, he heard that M.

Perrot, a dealer in Paris, had this egg for sale; whereupon, on his way home through Paris, he purchased it for 200 francs (£8). This statement is confirmed by a letter from Sir William Milner himself, written before 1860 (presumably in 1859), and printed by Mr. Grieve in his quarto volume on the Great Auk (p. 105), with the not very material variation that the writer was in Dusseldorf when he first heard of this egg, not at Heidelberg, as Mr. Champley misunderstood him to state. It has now once more changed hands, having been sold on April 23rd for 180 guineas to the proprietor of 'The Edinburgh Castle' in the Mornington Road, London, not the most fitting shrine that could be desired for such an ornithological treasure.

## FISHES.

**Boar-fish at Teignmouth.**—On April 9th a specimen of the Boar-fish, *Capros apor*, was sent to me for identification from Teignmouth, S. Devon, where this fish had suddenly appeared in large numbers. It was prior to 1844 considered a great rarity in British waters, but a Penzance trawler, in July of that year, found them plentifully near the Runnel Stone, close to Land's End, and they are usually to be obtained just there. The specimen before me measures about  $6\frac{1}{2}$  in. in length, and the curiously-hinged snout is capable of extension to the extent of an inch and a half.—E. AUGUSTUS BOWLES (Myddelton House, Waltham Cross, Herts).

[Attains a length of seven inches, and is called "Boar-fish" from the shape of the snout, which is capable of being greatly protruded. Small mollusca and crustacea have been found in the stomachs of those examined. First noticed as a British fish in 1825, when a specimen was captured in Mount's Bay. In 1833 some were taken at Bridgewater; in 1836, one at Teignmouth; and in March, 1842, one caught at Brighton was considered of sufficient rarity to be forwarded to Her Majesty the Queen. Since July, 1844, when about 200 were taken in a trawl off the Runnel Stone, it has been met with on various parts of the coast of Devon and Cornwall, and is now reported to be locally common between March and October.—ED.]

## SCIENTIFIC SOCIETIES.

## LINNEAN SOCIETY OF LONDON.

*April 4th, 1895.*—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Graf zu Solms Laubach, and Messrs. C. A. Barber, S. T. Dunn, J. D. Haviland, and A. P. Young were admitted, and the Rev. A. Thornley, J. W. Carr, and W. H. Wilson Elliott were elected Fellows.

On behalf of Mr. W. B. Hemsley, Dr. O. Stapf exhibited some new plants from the Solomon Islands, collected by the Rev. R. B. Comins.

Mr. S. W. Silver exhibited a specimen of the New Zealand Frost-fish, *Lepidopus caudatus*, Günther, and commented upon the causes which had been assigned for the mortality to which this fish was periodically subject. Prof. Stewart, in reviewing published opinions on the subject, suggested the possibility of these fish (which in winter were often thrown up on the beach in hundreds) being attracted by the silvery brightness of the frosted banks, in the same way that birds perished from contact with the lanterns in lighthouses to which they were attracted during their migrations. Prof. Howes thought, from the published remarks of those who had written on the subject, that in some instances at least the fish supposed to be Frost-fish belonged to another species, and some confusion had been thereby created.

Mr. S. W. Silver also exhibited a large specimen of polished Totara-wood from New Zealand as illustrating the ornamental nature of a remarkable native tree which might be turned to good account, but which was being generally destroyed by burning, to clear the ground and save trouble, as was said, to agriculturists.

Mr. George Murray exhibited some calcareous pebbles formed by fresh-water Algæ, and, with the aid of the oxy-hydrogen lantern, showed the minute details of structure in specimens from different localities.

Dr. J. D. Haviland exhibited a curious collection of *Termites*, including living specimens of the White Ant of Borneo, and gave a brief account of their habits. His remarks were criticised by Mr. A. Constable, who offered some observations upon Indian species of *Termites*.

A paper was then read by Mr. H. N. Ridley on the *Cyrtandraceæ* of the Malay Peninsula, illustrated by selected specimens of some of the more remarkable species.

*April 18th.*—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Surgeon-Capt. W. H. Elliot was admitted and Mr. W. Will was elected a Fellow.

In view of the approaching Anniversary Meeting, the election of auditors was proceeded with, when Mr. A. D. Michael and Prof. J. R. Green were nominated on behalf of the Council, and Messrs. E. M. Holmes and H. Groves on behalf of the Fellows.

Mr. T. B. Blow exhibited specimens of the river-weed *Mourera fluviatilis*, Aublet, from the River Essequibo, with observations on its life-history, and lantern-slides illustrating the natural haunts of the plant.

Mr. J. E. Harting exhibited and made remarks upon a collection of West African Lepidoptera which had been forwarded by Mr. J. T. Studley from Old Calabar, and was to be presented to the Natural History Museum, South Kensington.

Mr. Howard Saunders exhibited a specimen of the European White-winged Crossbill, *Loxia bifasciata*, which had been shot near Enniskillen,

Co. Fermanagh, in February last (Zool. p. 110), and was lent for exhibition by Mr. C. Langham.

Some photographs of English Red-deer heads, showing successive growths of antlers in the same stag, by comparison of the shed horns, were exhibited by Mr. Harting, on behalf of Mr. Lucas, of Warnham Court, Horsham.

Mr. A. Trevor Battye exhibited and made remarks upon a collection of plants obtained during his sojourn last summer upon the island of Kolguev.

A paper was then read by Mr. F. W. Keeble entitled "Observations on the *Loranthaceæ* of Ceylon," in which island the author had made a short sojourn in 1894. After remarking that in Ceylon many species of *Loranthus* have large and conspicuous flowers, with the corolla-tube brightly coloured, more or less tubular, and lobed, he pointed out that certain deviations from the typical regularity of the corolla-tube were correlated with the mode of fertilization of the flower by Sun-birds (*Nectarineæ*), and this was made clear by diagrams and some excellent coloured drawings. Discussing the mode of distribution of the seeds, Mr. Keeble first quoted the views of Engler and Prantl, and the remarks in Kerner's 'Pflanzenleben' (English edition), on the dissemination of the European Mistletoe, and then detailed his own observations in the case of tropical *Loranthaceæ*. The modes of germination of various species of *Loranthus* and *Viscum* were then described, as well as the curvature and growth of the hypocotyl, and the effect of contact on the latter, and on its suckorial disc; the paper concluding with some remarks on the forms of fruit and seed of Ceylonese species of *Loranthaceæ*.

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#### ZOOLOGICAL SOCIETY OF LONDON.

April 2nd, 1895.—Mr. W. T. BLANFORD, F.R.S., Vice-President, in the chair.

The Assistant-Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, 1895.

The Acting Secretary, Mr. Howard Saunders, exhibited, on behalf of Lord Lilford, a specimen of the American Wigeon, lately obtained in Yorkshire by Sir R. Payne-Gallwey, Bart., as reported in 'The Field' of the 9th March last.

Mr. H. E. Dresser exhibited and made remarks on Dr. Radde's types of *Picus quadrifasciatus* and *Lanius obscurior* from the Caucasus.

Mr. Holding exhibited and remarked on some horns of cattle which showed a singular variation in colour.

Mr. Boulenger exhibited the type specimens of two new Chameleons from Usambara, German East Africa. Special interest attached to them from the



fact that they appeared to be more nearly related to the Madagascar species than to any of the numerous forms now known from continental Africa.

Mr. Walter E. Collinge read a paper on "The Sensory Canal System of Fishes," treating of the morphology and innervation of the system in the Physostomous Teleostei. Descriptions were given of eight species referable to seven genera in the families *Siluridæ*, *Esocidæ*, *Salmonidæ*, and *Muranidæ*.

Dr. St. George Mivart read a paper descriptive of the skeleton in *Lorius flavopalliatu*s, comparing it with that of *Psittacus erithacus*, and pointed out a number of differences in detail.

Mr. G. A. Boulenger made remarks on some cranial characters of the Salmonoid Fishes, and expressed the opinion that there was no justification for separating *Coregonus* and *Thymallus* from the *Salmonidæ* as had been proposed by Messrs. Cope and Gill.

Prof. T. W. Bridge read a paper in which he pointed out certain features in the skull of *Osteoglossum*, and directed special attention to the existence of a peculiar oral masticatory mechanism in *Osteoglossum formosum*, distinct from that furnished by the upper and lower jaws and their teeth. The existence of an essentially similar mechanism in the Ganoid *Lepidosteus osseus* was also described, and the conclusion was suggested that the two genera offer in this respect an interesting example of parallelism in evolution.

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ENTOMOLOGICAL SOCIETY OF LONDON.

*April 3rd.*—Professor RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. C. J. Gahan exhibited two examples, male and female, of a rare Prioned beetle, *Chariea cyanea*, Serville, which had been kindly sent to him for examination by Mons. René Oberthür, and stated that Lacordaire was mistaken with regard to the sex of the specimen which he described in the 'Genera des Coléoptères.' He pointed out that the elytra of the male were relatively much shorter than those of the female, and that the joints of the antennæ from the third to the tenth were biramose. Mr. Gahan also exhibited two species of the genus *Decarthria*, Hope, and said he believed these were the two smallest species of Longicorns known.

Dr. Sharp exhibited the soldiers and workers of a species of Termites found by Dr. Haviland in South Africa. He stated that these insects possessed eyes and worked in daylight like hymenopterous ants, and that in habits they resembled harvesting ants by cutting grass and carrying it into holes in the ground. Dr. Sharp said that although these holes were probably the entrance to the nests, Dr. Haviland was unable to find the actual nest, even by prolonged digging; so that the winged forms were still unknown. He thought this species was probably allied to *Termes*

*viarum* of Smeathman, in which the soldiers and workers possessed eyes, and had been observed by Smeathman to issue from holes in the ground, and whose nest could not be discovered. Mr. McLachlan observed that it was possible there might be species of *Termites* without any winged form whatever.

Mr. Rye called attention to the action of one of the conservators of Wimbledon Common, who, he stated, had been destroying all the aspens on the Common. He enquired whether it was possible for the Entomological Society to protest against the destruction of the trees. Mr. Goss said he would mention the matter to the Commons Preservation Society.

Mr. Francis Galton read a paper entitled "Entomological Queries bearing on the question of Specific Stability." The author said that the information desired referred to:—(1) Instances of such strongly marked peculiarities, whether in form, in colour, or in habit, as had occasionally appeared in a single individual in a brood; but no record was wanted of monstrosities, or of such other characteristics as were clearly inconsistent with health and vigour. (2) Instances in which any one of the above peculiarities had appeared in the broods of different parents. In replying to this question, he said it would be hardly worth while to record the sudden appearance of either albinism or melanism, as both were well known to be of frequent occurrence. (3) Instances in which any of these peculiarly characterised individuals had transmitted their peculiarities, hereditarily, to one or more generations.

Mr. Merrifield stated that he received some years ago, from Sheffield, ova of *Selenia illustraria*, the brood from which produced, in addition to typical specimens, four of a dark bronze colour, and from these he bred a number of specimens of a similar colour. Dr. F. A. Dixey referred to a variety of the larva of *Saturnia carpini* with pink tubercles. He said the imago bred from this larva produced larvæ of which ten per cent. had pink tubercles. Professor Poulton said he had found larvæ of *Smerinthus ocellatus* with red spots, and that this peculiarity had been perpetuated in their descendants.

Mr. G. F. Hampson read a paper by Mr. C. W. Barker entitled "Notes on Seasonal Dimorphism in certain Species of *Rhopalocera* in Natal." Mr. Merrifield said he was of opinion that a record of the temperature at different seasons would be a very desirable addition to observations of seasonable dimorphism. Mr. Hampson said he believed that temperature had very little to do with the alteration of forms. At any rate, according to his experience, in India the wet-season form succeeded the dry-season form without any apparent difference in the temperature. Professor Poulton remarked that the apparent temperature as felt must not be relied upon without observations taken by the thermometer.

—H. Goss and W. W. FOWLER, *Hon. Secretaries.*

## NOTICES OF NEW BOOKS.

*The Anatomy, Physiology, Morphology, and Development of the Blow Fly (Calliphora erythrocephala): a Study in the Comparative Anatomy and Morphology of Insects; with illustrations from original drawings by the Author.* By B. THOMPSON LOWNE. 2 vols. 8vo. London: R. H. Porter. 1890-95.

THIS work is the result of a series of investigations commenced by Prof. Lowne in 1868, and continued with brief interruptions to the present time. The two volumes, which have been appearing in parts since 1890, are now completed, and contain 776 pages, illustrated with more than 500 original drawings, and full references to 376 memoirs, which, with three or four exceptions, have been carefully studied by the author. There is a copious index containing more than 3000 references, and as the comparative anatomy of the various parts is given, the work will be found a most useful aid to the study of the anatomy of insects generally, on which subject we know of no book of similar extent.

The preparation of such a large number of illustrations as it contains has naturally made it somewhat costly (the published price being three guineas net), but the possessor of a copy will have at command a veritable *multum in parvo*, the cream of a small library on insect anatomy, elucidated and supplemented by the author's remarks, the outcome of years of laborious research.

*A Year of Sport and Natural History: Shooting, Hunting, Coursing, Falconry, and Fishing; with Chapters on Birds of Prey, the Nidification of Birds, and the Habits of British Wild Birds and Animals.* Edited by OSWALD CRAWFURD. With numerous illustrations. 4to, pp. i-xii, 1-331. London: Chapman & Hall. 1895.

UNDER this title Mr. Oswald Crawford, the late editor of 'Black and White,' has brought together in most attractive form a series of articles which were contributed by different writers to that journal under the heading "Field Sports and Field Studies." Seasonal phases of sport and natural history for every month of the year are presented in no less than forty-five chapters, all of which are appropriately illustrated, though in some cases the drawing is not always accurate. The sketch of a Short-eared Owl

on the point of seizing a rabbit as it escapes in a burrow (p. 70) must have been suggested by a plate in Wolf's 'Wild Animals,' wherein an Eagle Owl is depicted in a somewhat similar attitude. But the suggestion of a habit which is true of the Eagle Owl is not so in the case of the Short-eared species, which usually preys upon much smaller quarry. The Sparrowhawk on p. 73 displays a superfluity of tail-feathers, making the tail look too broad and at the same time too short in proportion to the wings. In the figures of the Marsh Harrier (p. 79), the Osprey (p. 85), and the Peregrine (p. 87) the wings are incorrectly drawn, being neither of the right shape, nor held in the right position. No Falcon ever holds its wings as depicted on the last-mentioned page, nor as shown in the case of the Hobby (p. 89).

But for these defects we are compensated in other chapters by some good figures of the human subject. A pleasing example of this is to be found in the plate entitled "Chantrey's famous shot." In this the artist has depicted a gentleman of the old school, with the tall hat of the period and long fowling-piece to match, firing through a wood at two Woodcocks crossing, both of which, as history relates, were killed at the one shot, and subsequently immortalised by being carved in white marble by the hand that slew them. Mr. Crawford has, of course, referred to some of the witty epigrams on the subject which were composed by eminent scholars of the day (1829), though he might have found some better than those selected in Muirhead's 'Winged Words on Chantrey's Woodcocks' (1857).

Strange to say, amongst all the field-sports dealt with, there is no account of Grouse-shooting; and although the habits of the Red-deer are described, as well as the mode of hunting it in Devon and Somerset, no chapter has been provided for the votaries of "Deer-stalking." In any subsequent edition this should be remedied, and yet another chapter added on "punting," by which we do not of course mean shooting wildfowl from a square-ended fishing-punt on a Norfolk broad (as depicted in the illustration facing p. 284), but the much more difficult art of approaching Wigeon, Wild Geese, and Swans in an estuary or tidal harbour by propelling a very differently shaped gunning-punt, decked fore and aft, while lying at full length amidships. This is a phase of sport which has many enthusiastic votaries, and should be adequately represented.